

THE AUSTRALIAN PLANT DISEASE RECORDER.

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Edited by:

K.E. Hutton, Biological Branch,
Department of Agriculture,
Box 36, G.P.O., Sydney.

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For confidential circulation to plant pathologists in
Australia. Please do not abstract.



PLANT DISEASE NOTES.CEREALS AND GRASSES.PHYLOGENIC RACES OF MAIZE RUST:

Studies of the maize rust fungus (Puccinia sorghi Schw.) were commenced at Grafton Experiment Farm in January, 1956. Two cultures of the fungus, collected locally, have been employed in glasshouse tests of maize seedlings for the identification of inbreds resistant to this pathogen. These cultures represent two distinct physiologic races, separated by the following infection results:-

<u>Inbred</u>	<u>Infection type with Race I acc 56:1</u>	<u>Infection type with Race II acc 56:2</u>
Tx 203	4	4
25	;1	;1
TxGJ39-25	;1-	4

Using these cultures 12 inbred lines resistant to race I and 9 resistant to race II have been identified. The inbred line GA is resistant to race I but shows a semi-resistant infection type with race II, while one inbred resistant to race I has not yet been tested with race II.

A detailed survey for physiologic races of maize rust cannot yet be conducted, but the author is anxious to determine whether avirulence on inbred 25 is widely distributed amongst isolates of the pathogen, and for this reason would like to receive a limited number of collections of uredospores from maize areas in N.S.W. and Queensland during the 1956-57 season.

- K.S. McWHIRTER.

Department of Agriculture,
Grafton. N.S.W.

MOULDY HEAD OR FALSE SMUT OF SORGHUM:

Specimens of sorghum and sweet sorghum affected with a grain disease superficially resembling a smut have been received over recent months from the Murrumbidgee Irrigation Area. Affected heads have blackened, shrunken grains instead of normal plump ones, sometimes only a few grains in a head being affected but more often a large proportion of the grain is damaged. The affected grains crumble easily between the fingers. In the field, estimates of reduction in yield due to this condition have been in the vicinity of 20% in some cases.

The condition is caused by the growth of various moulds (mainly Alternaria spp.) over broken grains. It is usually associated with wet conditions at the time the head is maturing and the wet causes the grains to burst, exposing the starchy contents, which make an excellent medium for mould growth. Bird-damaged grain may be affected in a similar way.

- J. WALKER.

Department of Agriculture,
Sydney.

The first object of the present report is to give an account of the progress of the work during the year 1881. The second object is to give an account of the results of the work during the year 1881. The third object is to give an account of the results of the work during the year 1881. The fourth object is to give an account of the results of the work during the year 1881. The fifth object is to give an account of the results of the work during the year 1881. The sixth object is to give an account of the results of the work during the year 1881. The seventh object is to give an account of the results of the work during the year 1881. The eighth object is to give an account of the results of the work during the year 1881. The ninth object is to give an account of the results of the work during the year 1881. The tenth object is to give an account of the results of the work during the year 1881.

1881

REPORT ON THE PROGRESS OF THE WORK

FIELD AND FODDER CROPS.LUCERNE ROOT ROT:

Recently G. Purss (A.P.D.R. 8:2:3, 1956) recorded a root rot of lucerne from Queensland caused by Phytophthora cryptogea. A species of Phytophthora (probably cryptogea) has also been isolated from rotting lucerne roots in New South Wales. Isolation was not obtained from well rotted roots but only from those showing slight rotting. In the former case, species of Fusarium and Rhizoctonia were commonly isolated. Root rot was very prevalent in lucerne stands during the very wet period at the beginning of 1956 and most probably Phytophthora was responsible for quite a lot of this damage.

- J. WALKER.

Department of Agriculture
Sydney.

VEGETABLES.EPIPHYTOTIC OF POTATO LATE BLIGHT IN TASMANIA:

In the season 1955-56 a widespread epiphytotic of late blight occurred in Tasmania. The disease first appeared in October 1955 on the North West Coast, and early crops of Bismarks were heavily attacked. By January, after frequent periods of favourable weather had occurred, outbreaks were being reported from many centres throughout the State. Main crop Bismarks, and to a lesser extent Brownells, were badly damaged. In the seed producing areas of the Midlands (Oatlands, Mt. Seymour) losses of over 75 per cent were sustained. Here, and in the Derwent and Huon Valleys, blight has not been known to cause damage of economic importance for at least 20 years.

During this season useful information has been obtained relating blight and the prevailing weather conditions. Continuous temperature, relative humidity and rainfall records were taken adjacent to growing crops and examined for periods favouring spread and development. The "Irish Rules" established by Bourke (Irish Farmers' Journal, 14th June, 1952, p.4) appear to be a reliable guide for timing spray applications on a local scale, provided the first of these periods is ignored. As a basis for regional warnings, Bourke's criteria are inadequate under Tasmanian conditions, where considerable variations in weather conditions occur over small distances.

- P. G. WILLIAMS.

Department of Agriculture,
Hobart.

SILVER SCURF OF POTATOES:

Silver scurf (Spondylocladium atrovirens Harz.) is, for the most part, of minor importance in New South Wales. Occasionally, however, tubers showing slight to severe disfigurement are received from coastal and tableland areas of the State.

The only record of varietal reaction to silver scurf is available in Burke's publication (Cornell Univ. A.E.S. Bull. 692, 1938) but none of the varieties listed therein are grown commercially in New South Wales and the reaction of our locally grown varieties was not known. Accordingly, 4 tubers of each of the varieties listed in the accompanying table were planted last spring in soil known to be infested with the causal organism of silver scurf. Tubers were dug in February and stored under conditions favourable for the development of the disease for 2 weeks. The severity of silver scurf was assessed according to the percentage of tuber surface area covered (Clark et al. Phytopathology 28: 878-890, 1938).

The results (Table 1) showed that generally, more silver scurf developed on the earlier maturing varieties than on the later maturing varieties. As all varieties were dug at the same time, this would be expected as the disease develops to a greater extent the more mature the tubers. However, the extent of development of silver scurf on the later maturing varieties would indicate that there did not appear to be promise of worthwhile resistance in the potato varieties grown commercially in New South Wales. Sporulation of the fungus occurred on all varieties.

TABLE 1.

Variety	% of surface area covered with silver scurf.		
	41% - 100%	61% - 100%	81% - 100%
	% tubers	% tubers	% tubers
Adina	59.9	46.6	33.3
Awaba	35.7	17.9	14.3
Aussie	95.2	66.7	52.4
Crana	100.0	72.2	33.3
Exton	47.6	28.6	19.1
Factor	63.3	48.3	33.3
Katahdin	87.5	78.1	53.1
Monak	37.0	29.6	11.1
Ontario	97.6	83.3	57.1
Saranac	59.2	24.5	14.3
Sebago	55.5	36.1	13.9
Sequoia	60.0	50.0	21.0

- R. J. CONROY.Department of Agriculture,
Sydney.

PINK ROOT OF ONIONS:

Pink root of onions was first described from Texas in 1921 by Taubenhause and Mally (Tex. Expt. Sta. Bul. 273) who attributed the disease to Fusarium Mallyi. Hansen (Phytopathology 19,691, 1929) tested the pathogenicity of several Fusarium species isolated from affected onions but none was pathogenic. Another fungus which he tested and described as Phoma terrestris produced the typical symptoms of pink root. This fungus was renamed Pyrenochaeta terrestris by Gorenz, Walker and Larson (Phytopathology 38 :831, 1948) and is widely recognized as the incitant of pink root.

In South Australia pink root was first recorded in 1926; it occurs every year in the vegetable growing areas of the Adelaide Hills and in some years causes appreciable economic loss. The disease is present in Western Australia (Waite Institute correspondence) and in Queensland (A.P.D.R. 2:4:49, 1950) but apparently Pyrenochaeta terrestris has, until recently, never been isolated from Australian specimens and the fungus is listed by the Plant Quarantine Service as not present in Australia.

Examination of infected roots revealed the presence of mycelium within the tissues, including "conglomerate masses of dark thick-wall bodies somewhat resembling chlamydospores" described by Hansen for P. terrestris. Infected roots were either washed several times in sterile water or surface sterilised with 1 : 1000 mercuric chloride before being planted on potato-dextrose-agar. Two fungi were consistently isolated from these roots. Isolate 1 was a species of Fusarium, much more frequently isolated from the washed roots than from those surface sterilized, and Isolate 2 was a fungus agreeing with the description of P. terrestris given in the literature. The latter isolate grew slower than the Fusarium and coloured the substrate bright pink; older cultures darkened and some became almost black. Pycnidia were not produced in culture although what appeared to be pycnidial primordia were formed abundantly. Walker (Diseases of Vegetable Crops, p. 248) states that some isolates of P. terrestris produce no pycnidia in culture.

The pathogenicity of both fungi was tested by sowing onion seed in inoculated and uninoculated soils of two types (unsterilised heavy red-brown silt loam and John Innes passing soil). There were three replicates of each treatment and the soils were inoculated by growing the fungi separately in a sand maize-meal mixture and adding 5 parts inoculum to 95 parts soil. The percentage emergence of seedlings in all pots was similar but four weeks after sowing the seedlings in both soils inoculated with Isolate 2 were severely stunted whereas those in the Fusarium inoculated soils were not affected. Examination of the seedlings showed that the roots of the stunted plants were severely rotted and coloured pink. The original fungus was re-isolated from these roots and there can be little doubt that it is Pyrenochaeta terrestris the fungus causing pink root of onions.

A. KERR.

Waite Institute,
Adelaide.

FRUIT.

SWEET LIME STOCK FOR CITRUS:

In Palestine the sweet lime is subject to a virus disease known as xyloporosis and recently this has been reported to be widespread in Florida. Work in Sydney with sweet lime indicator seedlings has shown that symptoms similar to those of xyloporosis can be produced by strains of the stem pitting virus. The addition of the tristeza virus does not appear to alter symptom development though in some cases an intensification occurs.

In stock trials at Hawkesbury Agricultural College, Washington navel oranges on sweet lime stock now about 14 years old are stunted, with small upright rather thickened leaves, and severe pitting of the wood surface and gum accumulation in the bark of the stock, symptoms typical of xyloporosis.

Lemon varieties on sweet lime have also proved a failure in Departmental trials. A case of suspected xyloporosis on rough lemon stock referred to previously (A.P.D.R. 4:2:17, 1952), is now thought to be a distinct condition (see next note). - LILIAN R. FRASER.

Department of Agriculture, Sydney.

STUNTING AND DECLINE OF SWEET ORANGE ON ROUGH LEMON STOCK:

In most orange orchards in coastal N.S.W. occasional stunted trees occur. Usually the percentage is quite low (0.5% or less) but sometimes may be as high as 5%. Valencia and Washington navel oranges and occasionally Emperor mandarins are involved. Such trees are small, crop poorly, suffer from die-back and show deficiency leaf patterns. One constant symptom is overgrowth of the scion. In healthy trees the rough lemon outgrows the orange scion slightly, but this is reversed in the stunted trees. The surface of the wood of the stock is often closely and deeply pitted, but the degree of pitting varies and pits are sometimes almost absent. Rough lemon stocks normally show a slight amount of pitting which it is believed is caused by the stem pit virus and it is thought that the pitting in the stunted trees may be due to the presence of a severe strain of stem pit virus, whose effects are intensified where stunting is also present.

In orchards at Colo (A.P.D.R. 4:2:17, 1952), Raymond Terrace, Pitt Town and Yarramundi there is evidence of spread of "stunt" to previously unaffected trees.

Rough lemon appears to be the most susceptible of the common commercial stocks. Affected orange and mandarin trees which have become partly self rooted do not continue to show decline symptoms. A case has been observed where a stunted tree had been inarched 8 years previously with 3 trifoliata seedlings. A striking improvement over non-inarched stunted trees had resulted and the inarches had made very good growth.

A virus is suspected but as yet no specific test seedlings have been found. Transmission studies are in progress.

- LILIAN R. FRASER.

Department of Agriculture,
Sydney.

DAMAGE TO PONCIRUS TRIFOLIATA:

During the flooding which occurred last autumn in the Hawkesbury Valley (A.P.D.R. 8: 2: 27, 1956) some citrus orchards were in a saturated condition or partly under water for periods up to 6 weeks. Surveys have shown that where trees on trifoliata stock were submerged for more than 5 days the stocks have died. Death was very rapid, and commenced at the exposed buttresses of the crown roots. No pathogen has been found, and it is thought that death may have been caused by the decomposition of organic matter piled round the butts, in the very warm weather which accompanied the flooding. A similar collapse occurred on river flats at Bourke in western New South Wales, following some weeks of flooding.

Observations in previous floods indicated that trifoliata was unharmed by periods of submergence of 6 weeks during the winter.

-LILIAN R. FRASER.

Department of Agriculture,
Sydney.

SOOTY BLOTCH OF APPLES:

This season growers in a few districts in Tasmania suffered a heavy incidence of a disfiguring blemish of apple fruit. Sooty patches about $\frac{1}{8}$ to $\frac{1}{4}$ of an inch in diameter developed over the surface of the fruit. In some properties up to 80% of the fruit were affected.

Specimens of affected fruit were forwarded to Dr. C.G. Hansford, Waite Agricultural Research Institute, who identified the causal organism as Gloeodes pomigena (Schw.) Colb.

Although this disease has probably been present in Tasmania for many years it has not been recorded previously. The high incidence this year was apparently associated with unusually humid conditions during the late summer and autumn, after the application of fungicides for black spot control had ceased.

The blotches were readily removed by rubbing while the fruit were damp, and growers were able to overcome the problem by passing fruit over the graders while they were moist.

- G.C. WADE.

Department of Agriculture,
Hobart.

NOTES ON APPLE FUNGICIDE TRIALS IN TASMANIA - SEASON 1955-56:

For the third year in succession spring weather was too dry for Venturia inaequalis infections to become established. Consequently, the incidence of black spot was very low. A few orchards reported late spot in susceptible varieties such as Cleopatra. However, in none of three experimental plots was there sufficient black spot to give any results - most trees being completely "clean".

Ripe spot (Glocosporium album) incidence on Sturmer was relatively high and highly significant results were obtained. The importance of the "pink" spray in controlling this disease was demonstrated again. Trees sprayed with Tuzet 4311 (a mixture of thiram, ziram and tetra-methyl dithio-carbamine acid methyl arsine) surprisingly showed high ripe spot incidence at picking time. This material also caused considerable leaf injury on Sturmer and Jonathan.

Karathane gave control of powdery mildew (Podosphaera leucotricha) equal to that obtained by a schedule of lime sulphur and colloidal sulphur. It did not cause as much russet as the sulphur schedule, maneb or glyodin on Sturmer, and it was also safe on Jonathan and Cox's Orange Pippin. In combination with thiram on Sturmer it produced fruit with particularly clean skin and still gave good mildew control.

P.M.F. gave good control of ripe spot at picking time but mildew control was very poor and mild russetting occurred.

Maneb russeted fruit as much as the sulphur schedule, while glyodin was slightly worse.

The combination of thiram and colloidal sulphur in all sprays except full bloom gave mildew control equal to the sulphur schedule and caused less russet. However, there was a significant increase in russet compared with the Karathane-thiram mixture.

- J.R. WARD.

Department of Agriculture,
Hobart.

APPLE BLACK SPOT ERADICATION EXPERIMENTS:

In Autumn 1955 eradicant post-harvest spraying with organic mercury compounds was carried out in isolated plots of apple trees at the following locations:-

Maroota (Windsor district).

A heavily infected plot of 220 trees of Granny Smith, Gravenstein and Willie Sharp, isolated by approximately five miles from the nearest apple tree was sprayed with 0.1% phenyl mercuric acetate. No further fungicide was applied until slight leaf infection was detected on five trees in one corner of the block on 22nd December, 1955. A single spraying with lime sulphur was then given and the crop was subsequently harvested with only two infected fruit, each showing a single lesion. This contrasted with a comparable orchard five miles distant at Glenorie where severe crop loss was sustained. That orchard was treated with an inadequate schedule of Bordeaux mixture and lime sulphur sprays.

Tumorrana (Tumut district)

Two small well isolated (about three miles) heavily infected home orchards of mixed varieties were sprayed with 0.1% phenyl mercuric chloride using inefficient spraying equipment. They received no spraying during the 1955-56 season and each grower harvested the best crop he could remember, about 1% of fruit being infected with black spot after one of the wettest seasons on record.

Orange.

A small orchard of 80 trees of Delicious and Granny Smith on the edge of the Orange district about one mile from the nearest orchard was treated with 0.05% phenyl mercuric chloride. Six trees were left unsprayed during the 1955 spring but developed a moderate infection by early December. The remainder of the crop was harvested free of black spot. It is believed that the failure in this plot was due either to inadequate isolation, insufficient concentration of the eradicant chemical, or to the formulation of the product used, this being different from the product used in all other experiments.

- K. E. HUTTON.

Department of Agriculture.
Sydney.

ERADICATION OF VENTURIA INAEQUALIS FROM INFECTED APPLE LEAVES:

It was reported previously by the author (A.P.D.R. 7:1:7, 1955) that the minimum effective concentration of phenyl mercuric chloride for eradication of Venturia inaequalis from infected apple leaves lay between 0.1% and 0.01%. Investigations within this range were carried out following spray treatment in autumn 1955 with phenyl mercuric chloride at 0.1%, 0.075%, 0.05% and 0.025%. Only the latter treatment allowed any perithecium to develop.

This experiment is being repeated.

- K. E. HUTTON.

Department of Agriculture.
Sydney.

EARLY DEFOLIATION RESTRICTS VENTURIA DEVELOPMENT:

In an experiment to determine the role of leaves which fall before harvest in the saprophytic phase of the life cycle of Venturia inaequalis under the conditions at Batlow, New South Wales, it was found that no perithecium of that fungus developed in leaves which fell during January, February or March. However, V. inaequalis developed freely in leaves which fell during April and abundantly in those which fell during May.

- K. E. HUTTON.

Department of Agriculture.
Sydney.

APPLE AND PEAR SCAB CONTROL DEMONSTRATION:

In collaboration with this Department's Division of Horticulture a demonstration of the value for black spot control, of post-harvest spraying with phenyl mercuric chloride in an entire district was commenced at Yetholme this autumn. Yetholme is a small, compact, extremely scab-labile, "late maturing" district situated in the central tablelands at an elevation of approximately 4,000 ft.

The eradicant spray was applied to all apple and pear trees within a circle of three miles radius centred on Yetholme Post Office. Within that area are twelve commercial orchards ranging from thirty acres to four acres and twenty-eight home orchards ranging from three acres to a few trees, the total area being approximately one hundred and seventy acres.

The spraying was done under the most difficult conditions and there were frequent delays occasioned by the persistently wet weather. Heavy black spot infection coupled with waterlogged soil conditions throughout the season hastened leaf fall and as most orchards carried heavy crops, which were slow to mature, harvesting was delayed. When the spraying work commenced on 23rd April, 1956, the trees were approximately five to ten per cent. defoliated, but when completed on 1st June few leaves remained. Most of the spraying had been completed by 15th May, at which stage the trees were fifty to sixty per cent. defoliated. A prolonged wet period then delayed the completion of the work

on the remaining twenty-five acres. In the orchards treated by hand spraying during May a light ground spray was required, but where automatic sprayers were used this was achieved adequately during the normal spraying procedure.

In the coming season the growers will apply a normal schedule of sprays, and will refrain from cultivating until December. The eradicator spray will be repeated next autumn. This demonstration is being financed through the Commonwealth Agricultural Extension Grant.

— K.E. HUTTON.

Department of Agriculture,
Sydney.

BITTER PIT INDUCED BY ORGANIC FUNGICIDES:

The last apple season was one favourable to the development of bitter pit. In most tableland districts prolonged water-logging of soil occurred when the fruit was commencing to ripen and much tree pit developed wherever crops were light and/or fruit large.

One factor in the widespread occurrence of bitter pit in this "on year" in New South Wales has been the effect of some organic fungicides in allowing increased fruit size and thereby increasing its liability to bitter pit. In a statistically designed fungicide testing experiment for black spot control the largest fruit and severe tree pit occurred with thiram and with ziram schedules. Slight pitting occurred with zineb and with captan, each of these treatments resulting in the production of slightly smaller fruit. In plots treated with lime sulphur during the ripening period there was a marked reduction in fruit size and no bitter pit was detected. In the latter category were three treatments (1) lime sulphur throughout the season (2) phenyl mercuric chloride to late December then lime sulphur, and (3) phenyl mercuric chloride plus wettable sulphur to late December then lime sulphur.

— K. E. HUTTON.

Department of Agriculture,
Sydney.

VEINBANDING AND NECROTIC SPOTTING OF WINTER COLE PEARS:

In December 1954 Winter Cole pears were seen at Premaydena on Tasman Peninsula suffering severe necrotic spotting of the leaves. Fruit on such trees were scabbed and heavily russeted.

Since then similar specimens have been received from orchards in both the north and south of the State. While few orchards suffer much loss from the fruit scabbing and russet, most Winter Cole pears appear to show mild necrotic spotting of the leaves.

Faint chlorotic areas in the leaves are the first sign of the leaf spotting. Necrotic spots develop from these areas, which are irregularly distributed on the leaf. The spots average about 5mm. diameter but sometimes they coalesce and involve a much greater area. In January the spotting is confined to spurs but by April spots are present on leaves anywhere on the tree.

The fruit are very scabby in January but, as they swell, a ring spot appearance develops on the calyx end. A more or less circular scab of diameter 2 to 4 mm. is frequently haloed by a thin ring of scabby russet. In all but the most severe cases fruit throw off the scabs by maturity but are still heavily russeted. In severe cases, scabs will still be present at harvesting and such fruit are invariably small and unmarketable. Although this factor is of minor economic importance, there are trees which never produce a commercial crop. Leaves at the base of an affected fruit cluster are always necrotic. While the leaf symptoms become more severe as the season progresses, the fruit symptoms tend to disappear.

Another symptom observed on pear foliage is vein banding. This symptom is less common but more severe. Russeted and scabby fruit are also associated with it. At first it appeared that only one leaf symptom was present on a given tree. However, as the season progressed, both leaf symptoms were seen to occur together on the same tree, in widely varying ratios. The vein banding is at first chlorotic, but later necrotic, producing a striking pattern. Leaves become pale and autumnally coloured between the veins and eventually fall. Some trees suffered considerable premature defoliation, generally on one or two limbs. Where such severe symptoms occurred, there were no fruit. Either there was no set in the spring or the fruit had been shed before seen by the writer on 6th February.

A limb of a tree heavily infected with vein banding showed only 3 inches terminal growth before defoliation. Bark on two year old and older wood was cracked and scaly.

Beurre Bosc pears in a row adjacent to affected Winter Coles showed mild vein banding symptoms on a few leaves. Fruit did not appear affected though some trees carried fruit with stony pit. By autumn, some Beurre Bosc leaves showed an unusual marginal pigmentation and scorching but it is doubtful whether these symptoms are associated with the Winter Cole troubles. No necrotic leaf spotting was seen on Beurre Bosc.

On one property visited, two types of Winter Cole trees were present. One was tall and had a heavy covering of dark coloured leaves. This type exhibited both types of leaf symptom and fruit scabbing. The other type of tree has an open framework of branches, has sparsely pale foliage and symptoms have not been observed on this type. In January the fruit on these trees was noticeably freer from russet and were larger. Unfortunately, the horticultural history of these two tree types is unknown.

Present indications suggest that these symptoms are due to a virus or virus complex. Grafting and budding experiments have been started. The writer has found only two references to these symptoms in literature - both extremely brief. Posnette and Harris ("Virus diseases of fruit crops" Nature, Lond. 170,4318 pp.181-2) say (in full) - "Besides stony-pit, two diseases of the vein banding and leaf flecking type have been identified and appear to have a stunting effect on quince-seedling indicator plants. The possible importance of these viruses in stock-scion incompatibility phenomena is being studied".

It would be interesting to know of the occurrence of these symptoms in other States.

- J. R. WARD.

Department of Agriculture,
Hobart.

SOIL TYPE AND BROWN ROT IN PEACHES:

Annual surveys have been made in the Goulburn Valley, Victoria, since 1950 to check statements made by growers and others that brown rot losses are more severe in peach fruit produced on a light soil than on a heavy soil.

The results have indicated that such observations have often been correct when confined to certain seasons and particular varieties. However, it is quite fallacious to assert that brown rot incidence is always higher in a light soil when compared with a heavy soil, or that such a difference in disease severity could be attributed solely to differences inherent in the soils rather than to the interaction of soil effects with one or more of the many other variables affecting the occurrence of brown rot. The most important of these latter variables are stage of fruit maturity; rainfall; type; timing and thoroughness of fungicidal application; and injury due to insects.

On heavy soils fruit will mature anything from a few days to two weeks later than fruit of the same variety grown on a light soil.

It is concluded that differences in the incidence of brown rot in peaches growing on different soil types, which have been observed in some seasons and not in others, are due principally to interactions between the effects of heavy rain at or near harvest, and the differences induced by the soil types in the stages of fruit maturity at the time of the rain.

The importance of such interactions is evidenced by the fact that whereas in certain seasons more severe losses from brown rot have occurred on light soils than on heavy soils, in other seasons the greater losses (up to 100%) have occurred in fruit growing on the heavy soils.

The latter type of loss was characteristic of the Pullar harvest in the 1949-50 season. Here the early fruit from the lighter soils was harvested under ideal conditions and was free of brown rot. Towards the end of the harvest period, very heavy rain fell and the remaining late maturing fruit on the heavy soils was practically all lost from brown rot.

The 1955-56 season was also notable for the many growers who suffered very severe losses in peaches growing on heavy soils. In the Shepparton area, losses, which finally increased to 100% before the harvest was complete, occurred

in fruit of the Pullar variety on heavy clay loam. The 1955-56 harvest period was characterised by heavy and frequent falls of rain during the latter part of the Golden Queen and Phillips harvests and throughout the Pullar harvest period.

Thus experience has shown that very severe losses from brown rot in the Goulburn Valley of Victoria cannot be avoided by the simple expedient of growing peaches on heavy soils as implied by H. R. Angell (J. Aust. Inst. Agric. Sci., 21:180-182, 1955).

- C. R. MILLIKAN.

Department of Agriculture,
Melbourne.

PRUNE RUST CONTROL:

In an experiment at Young during the 1955-56 season it was found that a schedule of 0.13% zineb plus 0.5% white oil sprays gave very good control of prune rust. It was superior to all other treatments, including the schedule of Bordeaux mixture 2-3-100- $\frac{1}{2}$ sprays which have given very good control in recent years. Thiram 0.12% plus 0.5% white oil gave better control relative to Bordeaux mixture than it had done in an experiment the previous season when used without oil. Captan 0.1% also gave good control while lime sulphur 1-100 was the least effective treatment. No organic fungicide caused injury but there was slight leaf yellowing and leaf fall with Bordeaux mixture.

The treatments were applied in a three-spray schedule which, as a result of previous experiments mainly using weak Bordeaux mixture, has been adopted as the standard schedule in the Young district. No budswell spray is required, the first spray being applied in late October, then early December and mid-January.

- K. E. HUTTON.

Department of Agriculture,
Sydney.

A FUSARIUM RESISTANT PASSION FRUIT STOCK:

Following glasshouse resistance trials by T. McKnight (Q'ld. J. Agric. Sci. 8: 1-4. 1951.) and G. S. Purss (unpublished records) Passiflora flavicarpa was selected as being possibly a suitable stock for P. edulis in areas subject to Fusarium wilt.

A replicated field trial was laid down on heavily infected soil using P. edulis on three types of P. flavicarpa stock and on its own roots. A total of 40 plants was set out in April 1955. Those P. edulis on their own roots had all succumbed to wilt by November of the same year. All those on P. flavicarpa stock are to date growing vigorously.

P. caerulea which also exhibits field resistance to Fusarium wilt is not favoured as a stock for Queensland conditions as the profuse production of root suckers would provide a dangerous source of the woodiness virus as well as an addition to cultural costs. Moreover this species is susceptible to base rot in this State.

- J. H. SIMMONDS.

Department of Agriculture & Stock,
Brisbane.

PAPAW ROOT ROT:

Since April 1955 a severe root rot of papaws has been under investigation. During this period, the disease has been responsible for the loss of many acres of plants in the Brisbane and Mackay districts.

Initial isolations from rotting roots, using water agar medium, yielded Pythium vexans de Bary. However, isolations from soil by the apple technique of Campbell (P.D.R. 33: 134-135. 1949.) showed that Phytophthora palmivora Butler was also associated. Later this organism was obtained on water agar medium using roots in very early stages of decay.

In inoculation experiments with potted papaw plants only P. palmivora was found to reproduce the disease. P. vexans was relatively non-pathogenic.

Outbreaks and spread of *Phytophthora* root rot have been correlated with periods of soil saturation, which have been frequent during the period of observation.

- D. S. TEAKLE.

Dept. of Agriculture & Stock,
Brisbane.

MISCELLANEOUS PLANTS.

PHYTOPHTHORA CINNAMOMI KILLS LIVE-OAK TREES:

The period February-March was one of the wettest ever experienced in Sydney and waterlogging occurred in many areas previously regarded as reasonably well drained. This provided excellent conditions for the growth of *Phytophthora cinnamomi*. Most spectacular of its victims were live oak trees in the Botanic Gardens and Centennial Park. In the Botanic Gardens 8 trees, one a very large specimen of *Quercus agrifolia* between 70 and 80 years old, died suddenly after the end of the wet period. At Centennial Park *Quercus virginiana* had been planted extensively about 40 years ago, as single specimens or in rows alternating with other species and in one case a fine avenue of about 30 trees. All these trees except those in particularly dry sites are now dead. No other species has been affected in the same way.

- LILIAN R. FRASER.

Department of Agriculture,
Sydney.

MISCELLANEOUS NOTES.BIG BUD WIDESPREAD IN VICTORIA:

Big bud, or virescence, normally occurs in areas north of the Dividing Ranges and in the north east of Victoria, but during the recent summer it was prevalent throughout the State.

Tomatoes in the Goulburn Valley and Swan Hill areas were severely affected, some crops showing up to 50% infection. In the metropolitan area, and at Werribee, the percentage infection was much lower being approximately 10% of the plants. Some infections were noted among seedling and varietal tomatoes in the Plant Breeding Section plots at Burnley. Big bud in tomatoes in the southern areas is a rare occurrence and the authors are so far unaware of a previous outbreak.

Lettuce seed crops in the widely separated districts of Swan Hill and Colac also showed typical virescence, while among the garden plants in the metropolitan area asters and gerberas were affected. It would appear that vector activity during the growing season was widespread and the movement of the virus, which may well be related to the aster yellows group, was quite extensive within Victoria.

- R. D. ANDERSON
and
- R. H. TAYLOR .

Department of Agriculture,
Melbourne.

ERROR IN PAGINATION - A.P.D.R., VOL. 8, NO. 2, 1956:

An error in pagination occurred in the previous number of A.P.D.R. This number covered pages 19 to 31 not 1 to 13 as indicated. In order to facilitate future reference to this volume it is suggested that these pages be re-numbered.

- EDITOR.

CHIEF IN CHARGE - A.D.A. NO. 2, 1950

an order to pay for the purchase of a car at A.D.A. No. 2, 1950. The order was issued on 10-10-50 and is in the file. It is suggested that the order be re-issued.

CHIEF

